User Manual

5K online UPS

Uninterruptible Power Supply System

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1. Important Safety Warning

Please comply with all warnings and operating instructions in this manual strictly. Save this manual properly and read carefully the following instructions before installing the unit. Do not operate this unit before reading through all safety information and operating instructions carefully.

1-1. Transportation

- Please transport the UPS system only in the original package to protect against shock and impact.

1-2. Preparation

- Condensation may occur if the UPS system is moved directly from cold to warm environment. The UPS system must be absolutely dry before being installed. Please allow at least two hours for the UPS system to acclimate the environment.
- Do not install the UPS system near water or in moist environments.
- Do not install the UPS system where it would be exposed to direct sunlight or near heater.
- Do not block ventilation holes in the UPS housing.

1-3. Installation

⚠To guarantee UPS normal operation, before connecting devices to the UPS, please verify that ground and neural lines of the connected devices are not short circuited. (see figure 1)

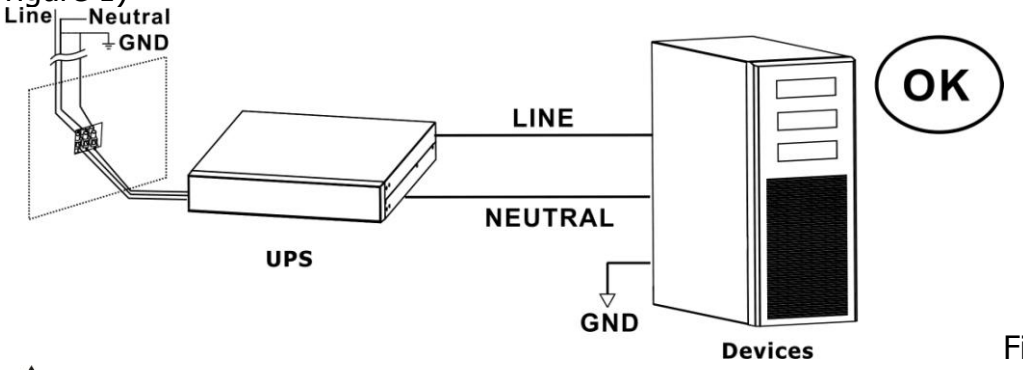


Figure 1

⚠If neutral line and ground line are short circuited, please add isolation transformer between UPS and devices. (see figure 2)

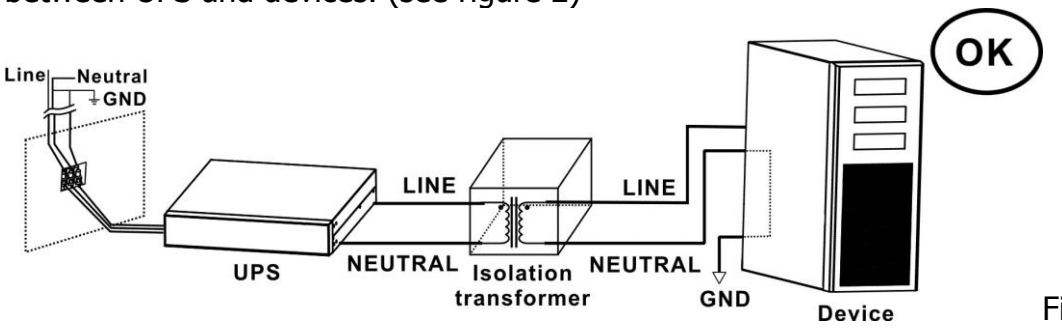


Figure 2

Do not connect appliances or devices which would overload the UPS system (e.g. laser printers) to the UPS output sockets.

- Place cables in such a way that no one can step on or trip over them.
- Do not connect domestic appliances such as hair dryers to UPS output sockets.

- The UPS can be operated by any individuals with no previous experience.
- Connect the UPS system only to an earthed shockproof outlet which must be easily accessible and close to the UPS system.

1-4. Operation

- Do not disconnect the mains cable on the UPS system or the building wiring outlet (shockproof socket outlet) during operations since this would cancel the protective earthing of the UPS system and of all connected loads.
- The UPS system features its own, internal current source (batteries). The UPS output sockets or output terminals block may be electrically live even if the UPS system is not connected to the building wiring outlet.
- In order to fully disconnect the UPS system, first press the OFF/Enter button to disconnect the mains.
- Prevent no fluids or other foreign objects from inside of the UPS system.

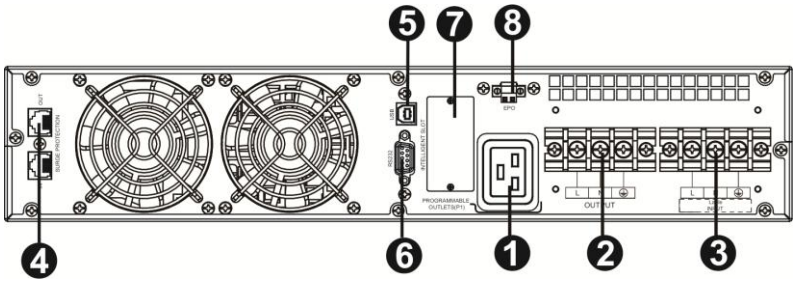
1-5. Maintenance, service and faults

- The UPS system operates with hazardous voltages. Repairs may be carried out only by qualified maintenance personnel.
- **Caution -** risk of electric shock. Even after the unit is disconnected from the mains (building wiring outlet), components inside the UPS system are still connected to the battery and electrically live and dangerous.
- Before carrying out any kind of service and/or maintenance, disconnect the batteries and verify that no current is present and no hazardous voltage exists in the terminals of high capability capacitor such as BUS-capacitors.
- Only persons are adequately familiar with batteries and with the required precautionary measures may replace batteries and supervise operations. Unauthorized persons must be kept well away from the batteries.
- **Caution -** risk of electric shock. The battery circuit is not isolated from the input voltage. Hazardous voltages may occur between the battery terminals and the ground. Before touching, please verify that no voltage is present!
- Batteries may cause electric shock and have a high short-circuit current. Please take the precautionary measures specified below and any other measures necessary when working with batteries:
  - remove wristwatches, rings and other metal objects
  - use only tools with insulated grips and handles.
- When changing batteries, install the same number and same type of batteries.
- Do not attempt to dispose of batteries by burning them. This could cause battery explosion.
- Do not open or destroy batteries. Escaping electrolyte can cause injury to the skin and eyes. It may be toxic.
- Please replace the fuse only with the same type and amperage in order to avoid fire hazards.
- Do not dismantle the UPS system.

2. Installation and setup

NOTE: Before installation, please inspect the unit. Be sure that nothing inside the package is damaged. Please keep the original package in a safe place for future use.

2-1. Rear panel view

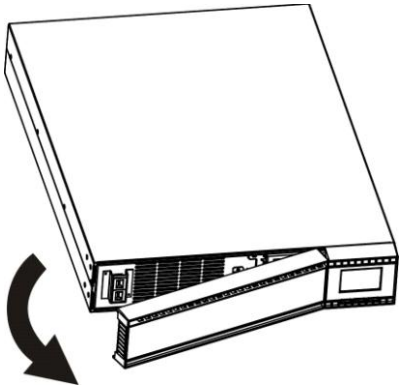


1. Programmable outlets: connect to non-critical loads.
2. Output terminal
3. Input terminal
4. Network/Fax/Modem surge protection
5. USB communication port
6. RS-232 communication port
7. Intelligent slot
8. Emergency power off function connector (EPO)

2-2. Install the UPS

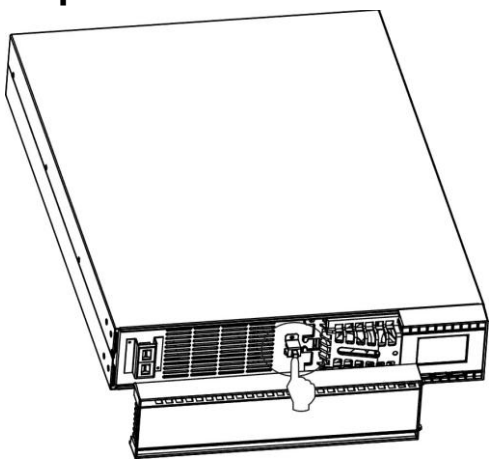
For safety consideration, the UPS is shipped out from factory with the main switch off. Before installing the UPS, please follow below steps to activate the UPS first.

Step 1

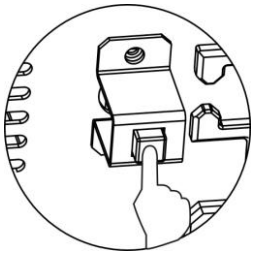


Remove front panel.

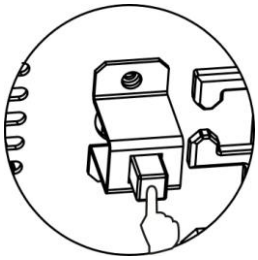
Step 2



Press the main switch to activate the UPS.

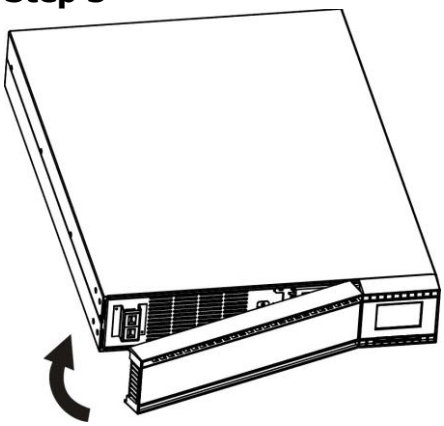


Press the main switch to activate the UPS.



Press again to inactivate the UPS.

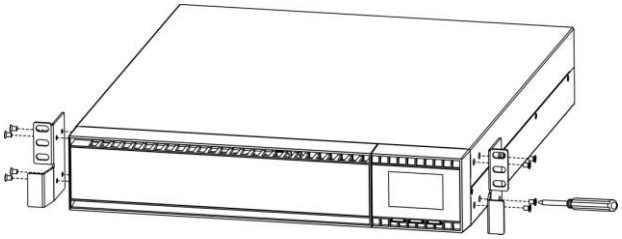
Step 3



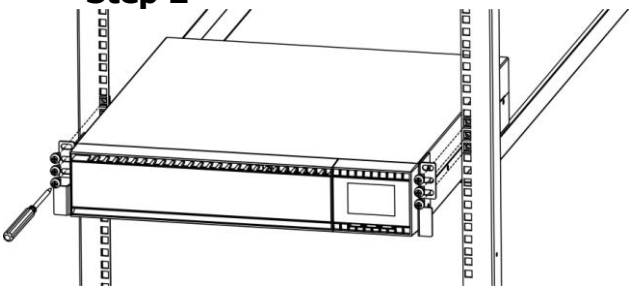
Put the front panel back to the unit.

Rack-mount Installation

Step 1

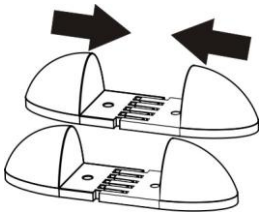


Step 2

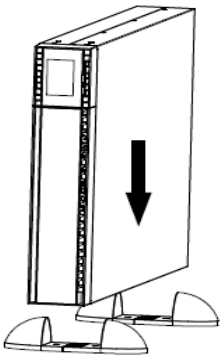


Tower Installation

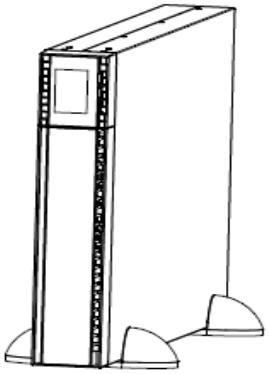
Step 1



Step 2



Step 3



Step 1: UPS input connection

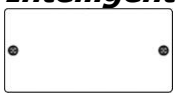
Plug the UPS into a two-pole, three-wire, and grounded receptacle only. Please do not use extension cords. The input plug is #12*3C.

Step 2: UPS output connection

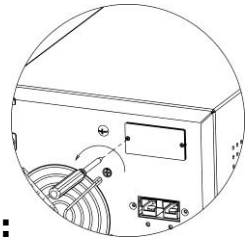
Simply plug devices to output sockets. During power failure, UPS will provide power to connected devices.

Step 3: Communication connection

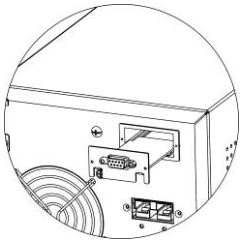
Intelligent slot



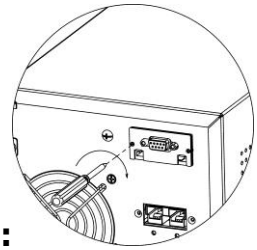
This model is equipped with intelligent slot perfect for SNMP, RS-232, USB or AS-400 card. When installing with these communication card in the UPS, it will provide advanced communication and monitoring options.



Step 1:
Remove cover of intelligent slot.



Step 2:
Insert communication card into the slot



Step 3:
Screw card tightly and complete installation.

Step 4: Turn on the UPS

Be sure to press the main switch to activate the UPS first before turning on the UPS.
Then, press the ON/Mute button on the front panel for two seconds to power on the UPS.

Important!!

Only operate main switch for initial usage or long-term storage.

Note: The battery charges fully during the first five hours of normal operation. Do not expect full battery run capability during this initial charge period.

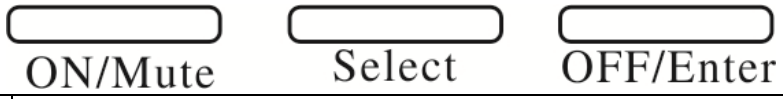
Step 5: Install software

For optimal computer system protection, install UPS monitoring software to fully configure UPS shutdown. You may insert provided CD into CD-ROM to install the monitoring software. If not, please follow steps below to download and install monitoring software from the internet:

1. Go to the website **http://www.power-software-download.com**
2. Click ViewPower software icon and then choose your required OS to download the software.
3. Follow the on-screen instructions to install the software.
4. When your computer restarts, the monitoring software will appear as an orange plug icon located in the system tray, near the clock.

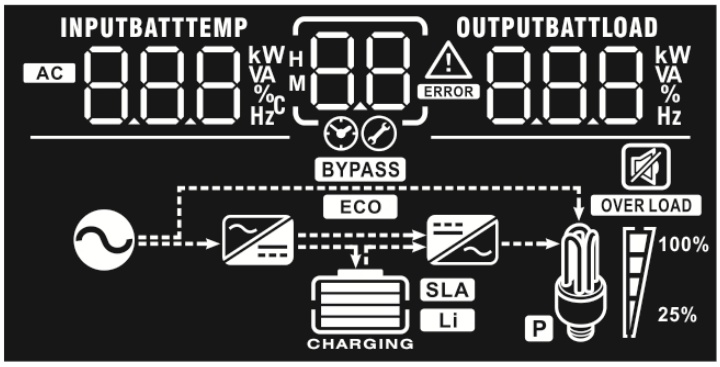
3. Operations

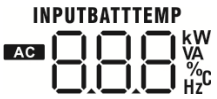
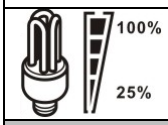
3-1. Button operation



Button	Function
ON/Mute Button	➢ Turn on the UPS: Press and hold ON/Mute button for at least 2 seconds to turn on the UPS. ➢ Mute the alarm: After the UPS is turned on in battery mode, press and hold this button for at least 5 seconds to disable or enable the alarm system. But it's not applied to the situations when warnings or errors occur. ➢ Up key: Press this button to display previous selection in UPS setting mode. ➢ Switch to UPS self-test mode: Press ON/Mute buttons simultaneously for 5 seconds to enter UPS self-testing while in AC mode or converter mode.
OFF/Enter Button	➢ Turn off the UPS: Press and hold this button at least 2 seconds to turn off the UPS in battery mode. UPS will be in standby mode under power normal or transfer to Bypass mode if the Bypass enable setting by pressing this button. ➢ Confirm selection key: Press this button to confirm selection in UPS setting mode.
Select Button	➢ Switch LCD message: Press this button to change the LCD message for input voltage, input frequency, battery voltage, output voltage and output frequency. It will return back to default display when pausing for 10 seconds. ➢ Setting mode: Press and hold this button for 5 seconds to enter UPS setting mode when UPS is in standby mode or bypass mode. ➢ Down key: Press this button to display next selection in UPS setting mode.
ON/Mute + Select Button	➢ Switch to bypass mode: When the main power is normal, press ON/Mute and Select buttons simultaneously for 5 seconds. Then UPS will enter to bypass mode. This action will be ineffective when the input voltage is out of acceptable range.

3-2. LCD Panel



Display	Function
Input Information	
	Indicates the AC input voltage, AC input frequency, battery voltage, battery discharge/charge current, and ambient temperature.
Setting programs, error codes and backup time information	
	Indicates the estimated backup time. H: hours, M: minute
	Indicates the setting programs and the detailed settings are listed in section 4.
	Indicates warning and fault codes and detailed codes are listed in section 7 and 8.
Output information	
	Indicate the output voltage, output frequency, load level, load in VA, and load in Watt.
Battery information	
	Indicates battery level (by 0-24%, 25-49%, 50-74%, and 75-100%), charging status and battery type (by SLA, Li). SLA: sealed lead acid battery ; Li: Li battery
Load information	
	Indicates overload.
	Indicates the load level by 0-24%, 25-50%, 50-74%, and 75-100%.
Mode operation information	
	Indicates the UPS connects to the mains.
	Indicates the bypass circuit is working.
	Indicates the ECO mode is enabled.
	Indicates the PFC circuit is working.
	Indicates the inverter circuit is working.
Mute operation	
	Indicates that the UPS alarm is disabled.
Programmable outlets information	
	Indicates that programmable outlets are working.

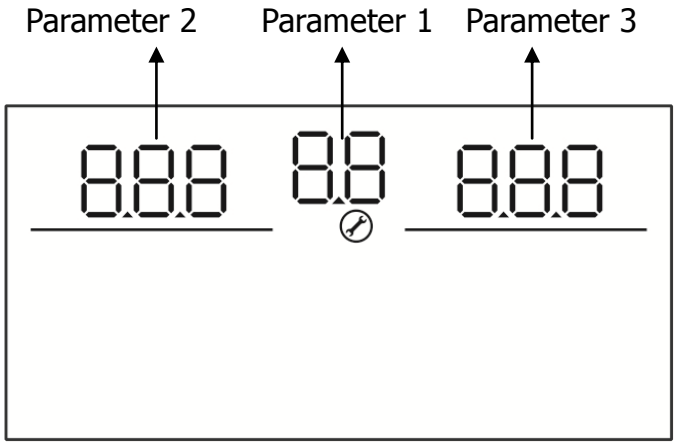
3-3. Audible Alarm

Battery Mode	Sounding every 4 seconds
Low Battery	Sounding every second
Overload	Sounding twice every second
Fault	Continuously sounding
Bypass Mode	Sounding every 10 seconds

3-4. LCD display wordings index

Abbreviation	Display content	Meaning
ENA	ENA	Enable
DIS	dIS	Disable
ESC	ESC	Escape
HLS	HLS	High loss
LLS	LLS	Low loss
EP	EP	Emergency power off
TP	tP	Temperature
CH	CH	Charger
BF	bF	Battery fault
BR	bt	Battery replace
ON	ON	ON
FU	FU	Bypass frequency unstable

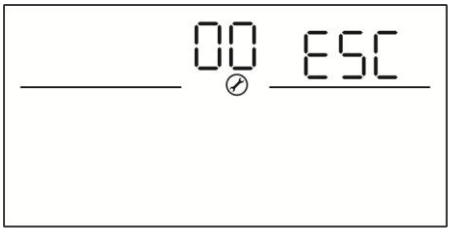
3-5. UPS Setting



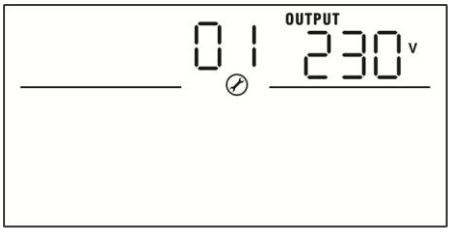
There are three parameters to set up the UPS.

Parameter 1: It's for program alternatives. Refer to below table for detailed setting programs.
Parameter 2 and parameter 3 are the setting options or values for each program.

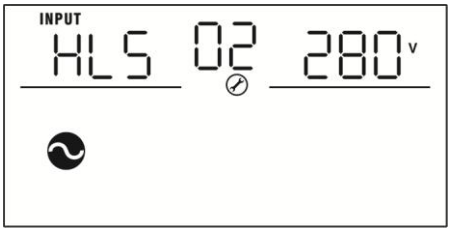
- **00: Exit**

Interface	Setting
	Exit UPS setting

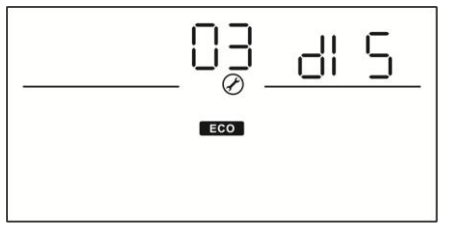
- **01: Output voltage setting**

Interface	Setting
	**Parameter 3: Output voltage** You may choose the following output voltage by pressing On/Mute (up-key) or Select (down-key) button. Then, press enter-key to confirm the selected output voltage. **220:** presents output voltage is 220Vac **230:** presents output voltage is 230Vac **240:** presents output voltage is 240Vac

- **02: Acceptable input voltage range**

Interface	Setting
	**Parameter 2 & Parameter 3:** Set acceptable high voltage point and low voltage point for Line mode by pressing On/Mute (up-key) or Select (down-key) button. **HLS:** High loss voltage in Line mode in parameter 3. For 220/230/240 VAC models, the setting range is from 260V to 280V. **LLS:** Low loss voltage in Line mode in parameter 3. For 220/230/240 VAC models, the setting range is from 170V to 190V.

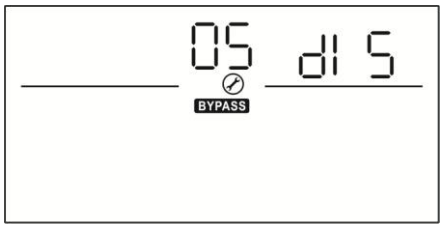
- **03: ECO enable/disable**

Interface	Setting
	**Parameter 3:** Enable or disable ECO function by pressing On/Mute (up-key) or Select (down-key) button. Then, press enter-key to confirm selection. **ENA:** ECO mode is enabled. **DIS:** ECO mode is disabled.

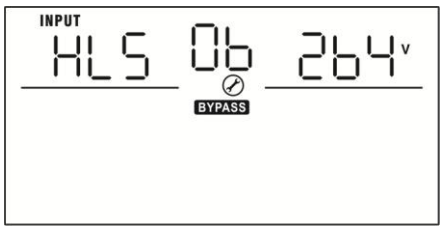
- **04: ECO voltage range setting**

Interface	Setting
	Parameter 2 & Parameter 3: Set acceptable high voltage point and low voltage point for ECO mode by pressing On/Mute (up-key) or Select (down-key) button. **HLS:** High loss voltage in ECO mode in parameter 3. For 220/230/240 VAC models, the setting range is from +7V to +24V of the nominal voltage. **LLS:** Low loss voltage in ECO mode in parameter 3. For 220/230/240 VAC models, the setting range is from -7V to -24V of the nominal voltage.

- **05: Bypass mode enable/disable when UPS is off**

Interface	Setting
	**Parameter 3:** Bypass mode enable/disable when UPS is off and the mains is ok. **ENA:** Bypass mode is enabled and there is output from UPS even though the UPS is off, but the mains is ok. **DIS:** Bypass mode is disabled and there is no output from UPS even though the mains is ok.

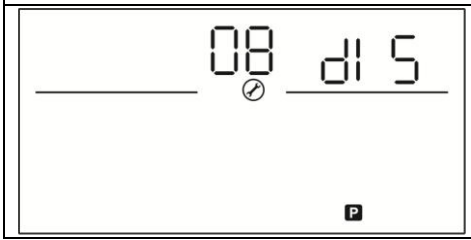
- **06: Bypass voltage range setting**

Interface	Setting
	**Parameter 2 & Parameter 3:** Set acceptable high voltage point and low voltage point for bypass mode by pressing On/Mute (up-key) or Select (down-key) button. **HLS:** High loss voltage in Bypass mode in parameter 3. For 220/230/240 VAC models, the setting range is from 230Vac to 264Vac. **LLS:** Low loss voltage in Bypass mode in parameter 3. For 220/230/240 VAC models, the setting range is from 170Vac to 220Vac.

- **07: Bypass frequency range setting**

Interface	Setting
	Parameter 2 & Parameter 3: Set acceptable high frequency point and low frequency point for Bypass mode by pressing On/Mute (up-key) or Select (Down-key) button. **HLS:** High frequency point in Bypass mode in parameter 3. For 50Hz models, the setting range is from 51.0Hz to 55.0Hz. **LLS:** Low frequency point in Bypass mode in parameter 3. For 50Hz models, the setting range is from 45.0Hz to 49.0Hz.

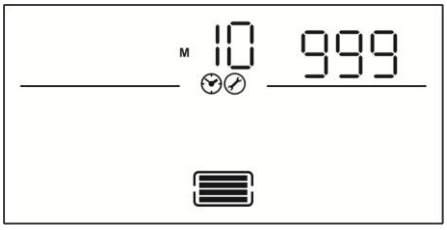
- **08: Programmable outlets enable/disable**

Interface	Setting
	**Parameter 3:** Enable or disable programmable outlets. **ENA:** Programmable outlets are enabled. **DIS:** Programmable outlets are disabled.

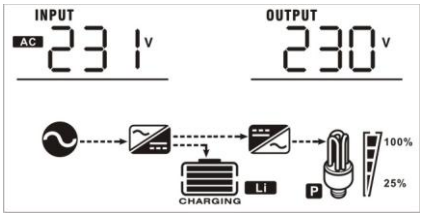
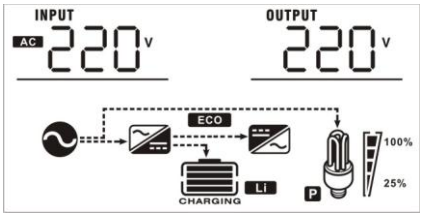
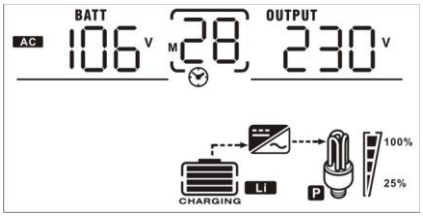
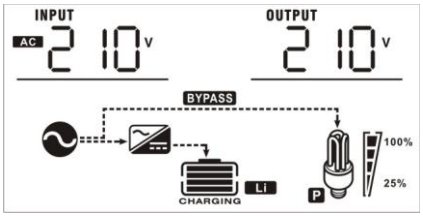
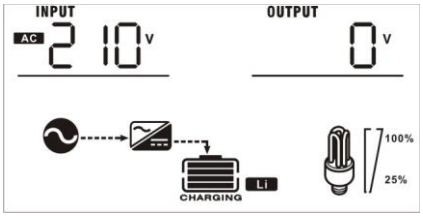
- **09: Programmable outlets setting**

Interface	Setting
	Parameter 3: Set up backup time limits for programmable outlets. **0-999:** setting the backup time limits in minutes from 0-999 for programmable outlets which connect to non-critical devices on battery mode.

- **10: Backup time setting for outlets**

Interface	Setting
	**Parameter 3:** Set up backup time on battery mode for general outlets. **0-999:** setting the backup time in minutes from 0-999 for general outlets on battery mode. **0:** When setting as "0", the backup time will be only 10 seconds. **999:** When setting as "999", the backup time setting will be disabled.

3-6. Operating Mode Description

Operating mode	Description	LCD display
Online mode	When the input voltage is within acceptable range, UPS will provide pure and stable AC power to output. The UPS will also charge the battery at online mode.	
ECO mode	Energy saving mode: When the input voltage is within voltage regulation range, UPS will bypass voltage to output for energy saving.	
Battery mode	When the input voltage is beyond the acceptable range or power failure and alarm is sounding every 4 second, UPS will backup power from battery.	
Bypass mode	When input voltage is within acceptable range but UPS is overload, UPS will enter bypass mode or bypass mode can be set by front panel. Alarm is sounding every 10 second.	
Standby mode	UPS is powered off and no output supply power, but still can charge batteries.	

3-7. Faults Reference Code

Fault event	Fault code	Icon	Fault event	Fault code	Icon
Bus start fail	01	x	Inverter voltage Low	13	x
Bus over	02	x	Inverter output short	14	x
Bus under	03	x	Battery voltage too high	27	x
Bus unbalance	04	x	Battery voltage too low	28	x
Inverter soft start fail	11	x	Over temperature	41	x
Inverter voltage high	12	x	Over load	43	OVER LOAD

3-8. Warning indicator

Warning	Icon (flashing)	Alarm
Low Battery	⚠ —	Sounding every second
Overload	⚠ OVER LOAD	Sounding twice every second
Battery is not connected	⚠	Sounding every second
Battery Replace	⚠ bt	Sounding every 2 second
Over Charge	⚠	Sounding every second
EPO enable	⚠ EP	Sounding every second
Over temperature	⚠ tP	Sounding every second
Charger failure	⚠ CH	Sounding every second
Out of bypass voltage range	⚠ BYPASS	Sounding every second

4. Storage and Maintenance

Operation

The UPS system contains no user-serviceable parts. If the battery service life (3 years at 25°C ambient temperature) has been exceeded, the batteries must be replaced. In this case, please contact your dealer.

Be sure to deliver the spent battery to a recycling facility or ship it to your dealer in the replacement battery packing material.

Storage

Before storing, charge the UPS 2 hours. Store the UPS covered and upright in a cool, dry location. During storage, recharge the battery in accordance with the following table:

Storage Temperature	Recharge Frequency	Charging Duration
-25°C - 30°C	Every 4 months	2 hours
30°C - 45°C	Every 1 month	2 hours

5. Specifications

Capacity		5000VA/4500W
INPUT		
Voltage Range	Low Line Transfer	170VAC ± 5 %
	Low Line Comeback	180VAC ± 5 %
	High Line Transfer	280VAC ± 5 %
	High Line Comeback	270VAC ± 5 %
Frequency Range		40 ~ 70 Hz（Auto sensing）
Phase		single phase L,N,G (Terminal)
Power Factor		0.95 up to 0.99 @ 170-260Vac
OUTPUT		
Output Voltage		220/230/240 VAC
AC Voltage Regulation (Batt. Mode)		± 1%
Frequency Range (Synchronized Range)		47 ~ 53 Hz or 57 ~ 63 Hz
Frequency Range (Batt. Mode)		50 Hz ± 0.2 Hz or 60Hz ± 0.2 Hz
Current Crest Ratio (CF)		3:1
Harmonic Distortion (THDU)		≦ 3% THD (Linear load) 6% THD (Non-linear Load)
Transfer Time	AC Mode to Batt. Mode	Zero
	Inverter to Bypass	4 ms (Typical)
Waveform (Batt. Mode)		Pure Sinewave
Phase		single phase L,N,G (Terminal)
EFFICIENCY		
AC Mode		92% peak（50-100% of full RCD load）
Battery Mode（@ 100% of full RCD load）		90% peak (during battery autonomy)
BATTERY		
Battery Type		Li battery
Battery Voltage		102V
Backup Time		4 min. @ 100% load / 6 min. @ 80% load
Typical Recharging Time		2 hours recovers to 90% capacity
PHYSICAL		
Dimension, D X W X H (mm)		600 x 438 x 88
Net Weight (kgs)		21
ENVIRONMENT		
Humidity		0-95 % RH @ 5- 40°C (non-condensing)
Noise Level		Less than 55dBA @ 1 Meter & around UPS with less than 80% Load
MANAGEMENT		
Smart RS-232 or USB		Supports Windows 2000/2003/XP/Vista/2008/7, Linux, Unix, and MAC
Optional SNMP		Power management from SNMP manager and web browser